Photo: City of Tallahassee Electric Lineman

City of Tallahassee
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2022-2031

City of Tallahassee Utilities

Ten Year Site Plan

Report prepared by: City of Tallahassee Electric System Integrated Planning

CITY OF TALLAHASSEE
TEN YEAR SITE PLAN FOR ELECTRICAL GENERATING FACILITIES AND ASSOCIATED TRANSMISSION LINES
2022-2031
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Cover photo: City of Tallahassee, Electric & Gas Utility Lineman

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III. Projected Facility Requirements

IV. Proposed Plant Sites and Transmission Lines

Chapter I

Description of Existing Facilities

1.0 INTRODUCTION

The City of Tallahassee ("City") owns, operates, and maintains an electric generation, transmission, and distribution system that supplies electric power in and around the corporate limits of the City. The City was incorporated in 1825 and has operated since 1919 under the same charter. The City began generating its power requirements in 1902 and the City's Electric Utility presently serves approximately 125,500 customers located within a 221 square mile service territory (see Figure A). The Electric Utility operates three generating stations with a total summer season net generating capacity of 725 megawatts (MW).

The City has three fossil-fueled generating stations, which contain combined cycle (CC), combustion turbine (CT) and reciprocating internal combustion engine (RICE or IC) electric generating facilities. The Sam O. Purdom Generating Station, located in the City of St. Marks, Florida has been in operation since 1952; the Arvah B. Hopkins Generating Station, located on Geddie Road west of the City, has been in commercial operation since 1970; and the Substation 12 Distributed Generation Facility, located on Medical Drive, has been in operation since late 2018.

1.1 SYSTEM CAPABILITY

The City maintains four points of interconnection with Duke Energy Florida ("Duke", formerly Progress Energy Florida); one at 69 kV, two at 115 kV, and one at 230 kV; and a 230 kV interconnection with Georgia Power Company (a subsidiary of the Southern Company ("Southern")).

As shown in Table 1.1 (Schedule 1), 222 MW (net summer rating) of CC generation is located at the City's Sam O. Purdom Generating Station. The Arvah B. Hopkins Generating Station includes 300 MW (net summer rating) of CC generation, 92 MW (net summer rating) of CT generation and 92 MW (net summer rating) of RICE generation. The Substation 12 Distributed Generation Facility includes 18 MW (net summer rating) of RICE generation. The CC and CT units can be fired on either natural gas or diesel oil but cannot burn these fuels concurrently. The RICE generators can only be fired on natural gas.

As of December 31, 2021 the City's total net summer installed generating capability is 725 MW. The corresponding winter net peak installed generating capability is 795 MW. Table 1.1 contains the details of the individual generating units.

1.2 PURCHASED POWER AGREEMENTS (PPA)

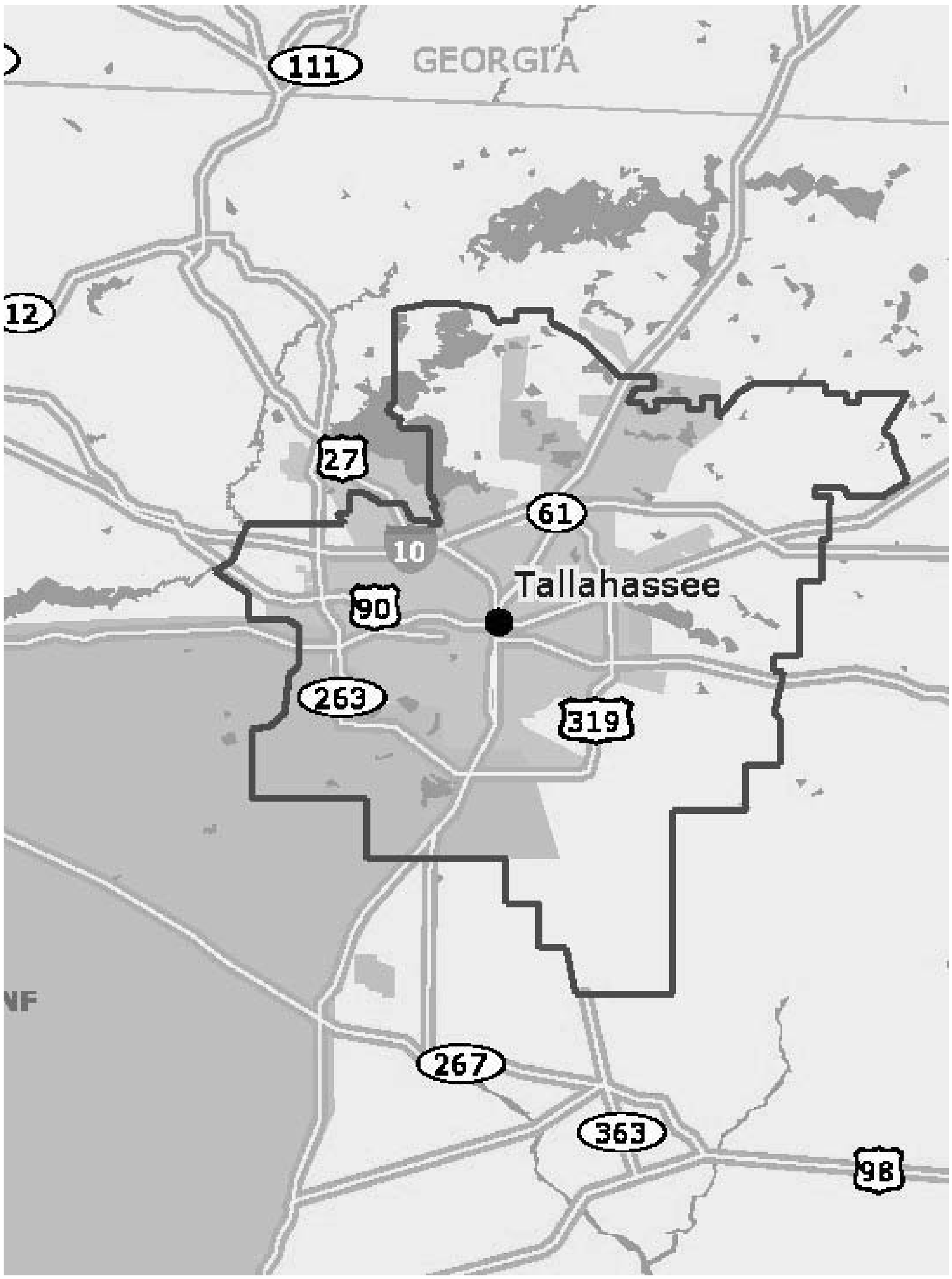
The City has no long-term firm wholesale capacity and energy purchase agreements. On July 24, 2016, the City executed a PPA for 20 MW_{ac} of non-firm solar PV with Origis Energy USA ("Origis"), doing business as FL Solar 1, LLC (Solar Farm 1). Solar Farm 1 is located adjacent to the Tallahassee International Airport and delivers power to City-owned distribution facility. The City declared commercial operations of the project on December 13, 2017. The City also entered into a second PPA with Origis (dba FL Solar 4, LLC) for a 42 MW_{ac} non-firm solar PV facility (Solar Farm 4). Solar Farm 4 is also located adjacent to the Tallahassee International Airport and interconnected with the City-owned 230 kV transmission system. Solar Farm 4 was placed into commercial operation on December 26, 2019. Together, Solar Farms 1 and 4 are the world's largest airport-based solar facility.

The City has conducted analyses of the output of the Solar Farm 1 and Solar Farm 4 facilities that revealed that neither contribute to meeting the winter peaks but do contribute towards meeting the summer peaks. Based on these analyses, an average of approximately 50% of the facilities' total rated capacity has been available during summer peak and near peak hours. However, given the limited operational experience with these resources, the City has elected to utilize a more conservative initial estimate of 20% of the combined rated capacity of the facilities as firm capacity available for the summer peak. The City will continue to review and, if appropriate, revise the assumed firm contribution from its solar power supply resources as additional operational experience is gained.

Firm retail electric service is purchased from and provided by the Talquin Electric Cooperative ("Talquin") to City customers served by the Talquin electric system. Similarly, firm retail electric service is sold to and provided by the City to Talquin customers served by the City electric system. In accordance with their territorial agreement certain Talquin facilities within the geographic boundaries of the City electric system service territory will be transferred to the City over the coming years. It is anticipated that these transfers will soon be completed after which time some City customers will continue to be served via Talquin facilities. Reciprocal service will continue to be provided to all Talquin customers currently served by the City electric system and those served by the facilities to be transferred to the City who choose to retain Talquin as their electric service provider. Payments for electric service provided to and received from Talquin and the transfer of customers and electric facilities is governed by the territorial agreement between the City and Talquin.

City of Tallahassee, Electric Utility

Service Territory Map



City Of Tallahassee

Schedule 1
Existing Generating Facilities
As of December 31, 2021

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
				Fuel		Fuel Transport		Alt. Fuel Days	Commercial In-Service	Expected Retirement	Gen. Max. Nameplate	Net Capability	
Plant	Unit No.	Location	Unit Type	Primary	Alternate	Primary	Alternate	Use	Month/Year	Month/Year	(kW)	Summer (MW)	Winter (MW)
S. O. Purdom	8	Wakulla	CC	NG	FO2	PL	TK	[1, 2]	7/00	12/40	270,100	222.0	258.0 [5]
											Plant Total	222.0	258.0
A. B. Hopkins	2	Leon	CC	NG	FO2	PL	TK	[2]	6/08 [3]	6/48	458,100 [4]	300.0	330.0 [5]
	GT-3		GT	NG	FO2	PL	TK	[2]	9/05	9/45	60,500	46.0	48.0
	GT-4		GT	NG	FO2	PL	TK	[2]	11/05	11/45	60,500	46.0	48.0
	IC-1		IC	NG	NA	PL	NA	NA	3/19	3/49	18,800	18.5	18.5
	IC-2		IC	NG	NA	PL	NA	NA	2/19	2/49	18,800	18.5	18.5
	IC-3		IC	NG	NA	PL	NA	NA	2/19	2/49	18,800	18.5	18.5
	IC-4		IC	NG	NA	PL	NA	NA	2/19	2/49	18,800	18.5	18.5
	IC-5		IC	NG	NA	PL	NA	NA	4/20	4/50	18,800	18.5	18.5
											Plant Total	484.50	518.5
Substation 12	IC-1	Leon	IC	NG	NA	PL	NA	NA	10/18	10/48	9,300	9.2	9.2
	IC-2		IC	NG	NA	PL	NA	NA	10/18	10/48	9,300	9.2	9.2
											Plant Total	18.4	18.4
									Total System Capacity as of December 31, 2021			724.9	794.9

[1] Due to the Purdom facility-wide emissions caps, utilization of liquid fuel at this facility is limited.

[2] The City maintains a minimum distillate fuel oil storage capacity sufficient to operate the Purdom plant approximately 9 days and the Hopkins plant and approximately 3 days.

[3] Reflects the commercial operations date of Hopkins 2 repowered to a combined cycle generating unit with a new General Electric Frame 7A combustion turbine. The original commercial operations date of the existing steam turbine generator was October 1977.

[4] Hopkins 2 nameplate rating is the sum of the combustion turbine generator (CTG) nameplate rating of 198.9 MW and steam turbine generator (STG) nameplate rating of 259.2 MW. However, in the current 1x1 combined cycle (CC) configuration with supplemental duct firing the repowered STG's maximum output is steam limited to about 150 MW.

[5] Summer and winter ratings are based on 95 °F and 29 °F ambient temperature, respectively.

CHAPTER II

Forecast of Energy/Demand Requirements and Fuel Utilization

2.0 INTRODUCTION

Chapter II includes the City's forecasts of demand and energy requirements, energy sources and fuel requirements. This chapter also explains the impacts attributable to the City's current Demand Side Management (DSM) plan. The City is not subject to the requirements of the Florida Energy Efficiency and Conservation Act (FEECA) and, therefore, the Florida Public Service Commission (FPSC) does not set numeric conservation goals for the City. However, the City expects to continue its commitment to the DSM programs that prove beneficial to the City's ratepayers.

2.1 SYSTEM DEMAND AND ENERGY REQUIREMENTS

Historical and forecast energy consumption and customer information are presented in Tables 2.1, 2.2 and 2.3 (Schedules 2.1, 2.2, and 2.3). Figure B1 shows the historical total energy sales and forecast energy sales by customer class. Figure B2 shows the percentage of energy sales by customer class (excluding the impacts of DSM) for the base year of 2022 and the horizon year of 2031. Tables 2.4 through 2.12 (Schedules 3.1.1 - 3.3.3) contain historical and base, high, and low forecasts of seasonal peak demands and net energy for load. Table 2.13 (Schedule 4) compares actual and two-year forecast peak demand and energy values by month for the 2021-2023 period.

2.1.1 SYSTEM LOAD AND ENERGY FORECASTS

The peak demand and energy forecasts contained in this plan are the results of the load and energy forecasting study performed by the City and its forecast consultant, nFront Consulting LLC ("nFront"). The forecast is developed utilizing essentially the same methodology first employed in 1980 that has since been updated and revised every one or two years. The methodology consists of a combination of multi-variable regression models and other models that utilize subjective escalation assumptions and known incremental additions. All models are based on detailed examination of the system's historical growth, usage patterns and population statistics. Several key regression formulas utilize econometric variables.

Table 2.14 lists the econometric-based regression forecasting models that are used as predictors. Note that the City uses regression models with the capability of separately predicting commercial customers and consumption by rate sub-class: general service non-demand (GS), general service demand (GSD), and general service large demand (GSLD). These, along with the residential class, represent the major classes of the City's electric customers. In addition to these customer class models, the City's forecasting methodology also incorporates into the demand and energy projections estimated reductions from interruptible and curtailable customers. The key explanatory variables used in each of the models are indicated by an "X" on the table.

Table 2.15 documents the City's internal and external sources for historical and forecast economic, weather and demographic data. These tables summarize the details of the models used to generate the system customer, consumption and seasonal peak load forecasts. In addition to those explanatory variables listed, a component is also included in the models that reflect the transfers of certain City and Talquin Electric Cooperative (Talquin) customers over the study period consistent with the territorial agreement negotiated between the City and Talquin and approved by the FPSC.

The customer models are used to predict the number of customers by customer class, some of which in turn serve as input into their respective customer class consumption models. The customer class consumption models are aggregated to form a total base system sales forecast. The effects of DSM programs and system losses are incorporated in this base forecast to produce the system net energy for load (NEL) requirements.

The seasonal peak demand forecasts are developed first by forecasting expected system load factor. Table 2.14 also shows the key explanatory variables used in developing the monthly load factor model. Based on the historical relationship of seasonal peaks to annual NEL, system load factors are projected separately relative to both summer and winter peak demand. The projected monthly load factors for January and August (the typical winter and summer peak demand months, respectively) are then multiplied by the forecast of NEL to obtain the summer and winter peak demand forecasts.

Some of the most significant input assumptions for the forecast are the incremental load modifications at Florida State University (FSU), Florida A&M University (FAMU), Tallahassee Memorial Hospital (TMH) and the State Capitol Center. These four customers account for a significant percentage of the City's total annual energy sales. Their incremental additions are highly dependent upon annual economic and budget constraints, which would cause fluctuations in their demand projections if they were projected using a model. Therefore, each entity submits their proposed incremental additions/reductions to the City and these modifications are included as submitted in the load and energy forecast.

In the first several months following the onset of the coronavirus pandemic, significant impacts were observed in much of the Florida economy, particularly in regions dominated by tourism, universities, and service industries including the Tallahassee service area. During this period, the City observed significant reductions in electricity consumption in its non-residential retail classes. Conversely, residential electric consumption increased considerably due to increased stay-at-home behavior and remote work. Some of these impacts lingered into 2022, albeit at significantly lower levels than during the early months of the pandemic.

The City and nFront continue to review past and prospective new inputs to the forecast methodology in an effort to capture the changes in electric consumption patterns driven by the pandemic.

As with the 2021 forecast, the 2022 forecast utilizes mobility data published by Google as an input variable to help further explain 2020 electric consumption deviations in the residential and non-residential classes from pre-pandemic levels. The mobility data provides information regarding people's location and activity at home versus at commercial business and workplaces and helps explain the deviations in electric consumption by class observed since the onset of the pandemic.

These deviations have diminished somewhat over time but it is clear that a return to normal is not yet complete for much of the non-residential class. As with the 2021 forecast, the City worked with nFront to refine its assumptions in its 2022 forecast regarding the extent and timing of an eventual return to normal. The 2022 forecast assumes a gradual recovery from the impacts of the coronavirus pandemic, though recovery is projected to be somewhat slower for the commercial classes than for the residential class. The City will review the actual extent of the recovery versus that reflected in its 2022 forecast in its next forecast cycle to determine whether further adjustments to the forecast inputs and models are needed.

The rate of growth in residential and commercial customers is driven by the projected growth in Leon County population. Population growth projections decreased in the years immediately following the Great Recession that occurred between 2007 and 2009, and the current projection also shows a slightly lower growth in population versus last year. Leon County population is projected to grow from 2022-2031 at an average annual growth rate (AAGR) of 0.76%. This growth rate is below that for the state of Florida (1.07%) but is slightly higher than that for the United States (~0.71%).

Prior to the pandemic, per customer demand and energy requirements had decreased in recent years. This trend is expected to continue even as the coronavirus pandemic-driven stay-at-home and work-from-home behavior continues to abate over the next few years. There are several reasons for this decrease including but not limited to the historical and expected future issuances of more stringent federal appliance and equipment efficiency standards and modifications to the State of Florida Energy Efficiency Code for Building Construction. It is also noteworthy that Florida has experienced a more pronounced decline in average usage than the rest of the U.S. during the 2005-2012 period and was one of the epicenters of the housing crisis during the Great Recession. Anecdotal evidence following this period suggested that a significant portion of homes in the City's service area remained unoccupied and that, as a result, there may have been some potential upside to average consumption as those homes were eventually taken up by full-time residents. More recent news reports have suggested that the demand for Tallahassee single family homes is outpacing the supply.

The City's energy efficiency and demand-side management (DSM) programs (discussed in Section 2.1.3) have also contributed to these decreases. However, the Clean Energy Plan (CEP) resolution (discussed in this chapter and further in Chapter III) promotes electrification which may somewhat offset the observed decrease in demand and energy per customer down the road.

In the 2022 forecast the City and nFront evaluated the potential for increases in the penetration of electric vehicles (EV). In 2019, the City adopted the CEP resolution and a clean energy goal which is expected to incorporate efforts to electrify the transportation sector. It is recognized that an increase in EV penetration has the potential to significantly increase the NEL and peak demand requirements for the City. Therefore, as part of their 2022 forecast work nFront produced explicit estimates of the potential impact on the City's load growth related to EV adoption for light duty vehicles (LDV). Historical data obtained from the Florida Department of Motor Vehicles indicates that EV penetration in Leon County (at approximately 0.5%) is considerably lower than for Florida overall (approximately 0.7%). And the forecast results suggest that by 2040, the incremental amount of light duty EV energy sales is estimated to be 1.3 percent of NEL on a gross of DSM basis.

The City believes that the routine update of forecast model inputs, coefficients and other minor model refinements continue to improve the accuracy of its forecast so that they are more consistent with the historical trend of growth in seasonal peak demand and energy consumption. The changes made to the forecast models for load and energy requirements have resulted in 2022 base forecasts for annual total retail sales/net energy for load and seasonal peak demand forecasts that are essentially equal to those previously projected.

2.1.2 Load Forecast Uncertainty & Sensitivities

To provide a sound basis for planning, forecasts are derived from projections of the driving variables obtained from reputable sources. However, there is significant uncertainty in the future level of such variables. To the extent that economic, demographic, weather, or other conditions occur that are different from those assumed or provided, the actual load can be expected to vary from the forecast. For various purposes, it is important to understand the amount by which the forecast can be in error and the sources of error.

To capture this uncertainty, the City produces high and low range results that address potential variance in driving population and economic variables, and severe and mild weather sensitivity cases that address the potential variance in driving weather variables from the values assumed in the base case. The base case forecast relies on a set of assumptions about future population, economic activity and weather in Leon County. However, such projections are unlikely to exactly match actual experience.

Population and economic uncertainty tend to result in a deviation from the trend over the long term. Accordingly, separate high and low forecast results were developed to address population and economic uncertainty. These ranges are intended to represent an 80% confidence interval, implying only a 10% chance each of being higher or lower than the resulting bounds. The high and low forecasts shown in this year's report were developed based on varied inputs of economic and demographic variables within the forecast models by nFront to capture approximately 80% of potential outcomes. These statistics were then applied to the base case to develop the high and low load forecasts presented in Tables 2.5, 2.6, 2.8, 2.9, 2.11 and 2.12 (Schedules 3.1.2, 3.1.3, 3.2.2, 3.2.3, 3.3.2 and 3.3.3).

Uncertainty regarding weather conditions has received more attention following the extreme 2021 winter weather event that impacted Texas. The City has worked, internally and with the other Florida utilities, to evaluate the increased electric load and its resultant impact on resource availability under extreme winter weather conditions consistent with such events that have occurred in Florida in the past. Given the City's winter reserve margin, backup fuel capabilities and system winterization efforts, the evaluation results indicate that the City's electric system would be well positioned to serve all of its customers during a one in forty-year extreme winter weather event like that experienced in Texas last year.

Sensitivities on the peak demand forecasts are useful in planning for future power supply resource needs. The graph shown in Figure B3 compares the planning reserve margin under three summer peak demand forecast sensitivity cases with reductions from the proposed DSM portfolio and the base forecast without proposed DSM reductions to the City's current 17% planning reserve criterion. This graph allows for the review of the effect of load growth and DSM performance variations on the timing of new resource additions. The highest probability weighting, of course, is placed on the base case assumptions, and the low and high cases are given a smaller likelihood of occurrence.

2.1.3 ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT PROGRAMS

The City currently offers a variety of conservation and DSM measures to its residential and commercial customers, which are listed below:

Residential Measures	Commercial Measures
Energy Efficiency Loans	Energy Efficiency Loans
Gas New Construction Rebates	Demonstrations
Gas Appliance Conversion Rebates	Information and Energy Audits
Information and Energy Audits	Commercial Gas Conversion Rebates
Ceiling Insulation Grants	Ceiling Insulation Grants
Low Income Ceiling Insulation Grants	Solar Water Heater Rebates
Low Income HVAC/Water Heater Repair Grants	Solar PV Net Metering
Low Income Duct Leak Repair Grants	
Neighborhood REACH Weatherization Assistance	
Energy Star Appliance Rebates	
High Efficiency HVAC Rebates	
Energy Star New Home Rebates	
Solar Water Heater Rebates	
Solar PV Net Metering	
Variable Speed Pool Pump Rebates	
Nights & Weekends Pricing Plan	
Smart Thermostat Rebate	

The City has a goal to improve the efficiency of customers' end-use of energy resources when such improvements provide a measurable economic and/or environmental benefit to the customers and the City utilities. During the City's last Integrated Resource Planning (IRP) Study completed in 2006 potential DSM measures (conservation, energy efficiency, load management, and demand response) were tested for cost-effectiveness utilizing an integrated approach that is based on projections of total achievable load and energy reductions and their associated annual costs developed specifically for the City. The measures were combined into bundles affecting similar end uses and /or having similar costs per kWh saved.

In 2012 the City contracted with a consultant to review its efforts with DSM and renewable resources with a focus on adjusting resource costs for which additional investment and overall market changes impacted the estimates used in the IRP Study. DSM and renewable resource alternatives were evaluated on a levelized cost basis and prioritized on geographic and demographic suitability, demand savings potential and cost. From this prioritized list the consultant identified a combination of DSM and renewable resources that could be cost-effectively placed into service by 2016. The total demand savings potential for the resources identified compared well with that identified in the IRP Study providing some assurance that the City's ongoing DSM and renewable efforts remained cost-effective.

In 2017 the City contracted with an engineering consultant to build upon the 2006 and 2012 studies and recommend DSM opportunities that are cost-effective alternatives to the City's evolving supply-side resources. The study concluded that many of the existing measures in the City's DSM program are cost-effective and several new measures related to demand response (DR) appear to be promising based on the benefit-cost evaluation. Battery storage and thermal storage do not appear to be cost-effective at this time, based on the high capital cost, but may be in the future combined with time-of-use rates with a large differential between the on-peak cost and off-peak cost. Storage may also serve as a means for mitigating the intermittency of solar PV and/or its non-coincidence with load requirements, particularly on sunny days with mild weather.

As discussed in Section 2.1.1 the growth in customers and energy use has slowed in recent years due in part to the economic conditions observed during and following the Great Recession as well as due to changes in the federal appliance/equipment efficiency standards and state building efficiency code and, more recently, due to the coronavirus pandemic. It appears that many customers have taken steps on their own to reduce their energy use and costs in response to the changing economy - without taking advantage of the financial incentives provided through the City's DSM program – as well as in response to the aforementioned appliance efficiency standards and code changes. These "free drivers" effectively reduce potential participation in the DSM program in the future. It is uncertain whether these customers' energy use reductions will persist. In the meantime, however, demand and energy reductions achieved as a result of these voluntary customer actions as well as those achieved by customer participation in City-sponsored DSM measures appear to have had a considerable and lasting impact on forecasts of future demand and energy requirements.

The latest projections reflect a revised outlook for DSM needs over the coming years. Future DSM activities will be based in part on the recommendations in the 2017 DSM study. The City has adopted a Clean Energy Plan resolution with the goal to achieve 100% renewable by

2050. This will likely impact the City's DSM programs and offerings. The City will provide further updates regarding progress with and any changes in future expectations of its DSM program in subsequent TYSP reports.

Energy and demand reductions attributable to the DSM portfolio have been incorporated into the future load and energy forecasts. Tables 2.16 and 2.17 display, respectively, the cumulative potential impacts of the proposed DSM portfolio on system annual energy and seasonal peak demand requirements. Based on the anticipated limits on annual control events it is expected that DR/DLC will be predominantly utilized in the summer months. Therefore, Tables 2.7-2.9 and 2.17 reflect no expected utilization of DR/DLC capability to reduce winter peak demand.

2.2 ENERGY SOURCES AND FUEL REQUIREMENTS

Tables 2.18 (Schedule 5), 2.19 (Schedule 6.1), and 2.20 (Schedule 6.2) present the projections of fuel requirements, energy sources by resource/fuel type in gigawatt-hours, and energy sources by resource/fuel type in percent, respectively, for the period 2022-2031. Figure B4 displays the percentage of energy by fuel type in 2022 and 2031.

The City's generation portfolio includes combustion turbine/combined cycle (CC), combustion turbine/simple cycle (CT), and reciprocating internal combustion engine (RICE or IC) generators. The City's CC and CT units are capable of generating energy using natural gas or distillate fuel oil. The RICE units utilize natural gas only. This mix of generation types coupled with the contracted solar PPAs and opportunity purchases allows the City to satisfy total energy requirements while balancing the cost of power with the environmental quality of our community.

The projections of fuel requirements and energy sources are taken from the results of computer simulations using the Hitachi ABB Power Grids Portfolio Optimization production simulation model and are based on the resource plan described in Chapter III.

City Of Tallahassee

Schedule 2.1
History and Forecast of Energy Consumption and Number of Customers by Customer Class

Base Load Forecast

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rural & Residential					Commercial		
Year	Population [1]	Members Per Household	(GWh) [2]	Average No. of Customers	Average kWh Consumption Per Customer	(GWh) [2]	Average No. of Customers	Average kWh Consumption Per Customer
2012	277,935	-	1,021	96,479	10,586	1,572	18,445	85,235
2013	279,468	-	1,014	97,145	10,442	1,544	18,558	83,183
2014	282,471	-	1,089	97,985	11,119	1,548	18,723	82,690
2015	285,651	-	1,088	99,007	10,989	1,567	18,820	83,263
2016	288,972	-	1,080	100,003	10,801	1,559	19,002	82,065
2017	290,466	-	1,059	100,921	10,497	1,558	19,130	81,439
2018	292,700	-	1,122	102,395	10,962	1,552	19,282	80,506
2019	294,200	-	1,152	104,104	11,063	1,565	19,434	80,505
2020	293,800	-	1,149	105,829	10,857	1,432	19,649	72,886
2021	296,400	-	1,139	106,321	10,713	1,426	19,580	72,829
2022	298,900	-	1,175	107,491	10,931	1,520	19,909	76,347
2023	301,500	-	1,176	108,697	10,819	1,568	20,076	78,103
2024	304,000	-	1,178	109,831	10,726	1,593	20,246	78,682
2025	306,500	-	1,179	110,860	10,635	1,607	20,405	78,755
2026	308,800	-	1,179	111,788	10,547	1,616	20,560	78,599
2027	311,200	-	1,179	112,704	10,461	1,625	20,712	78,457
2028	313,400	-	1,179	113,596	10,379	1,633	20,864	78,269
2029	315,700	-	1,182	114,474	10,325	1,641	21,016	78,083
2030	318,000	-	1,187	115,370	10,289	1,649	21,169	77,897
2031	320,000	-	1,192	116,204	10,258	1,654	21,317	77,591

[1] Population data represents Leon County population.
[2] Values include DSM impacts.

City Of Tallahassee

Schedule 2.2
History and Forecast of Energy Consumption and Number of Customers by Customer Class

Base Load Forecast

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Industrial				Street & Highway Lighting (GWh) [2]	Other Sales to Public Authorities (GWh) [3]	Total Sales to Ultimate Consumers (GWh) [4]
Year	(GWh)	Average No. of Customers [1]	Average kWh Consumption Per Customer	Railroads and Railways (GWh)			
2012	-	-	-		0	(7)	2,587
2013	-	-	-		0	(5)	2,553
2014	-	-	-		0	(7)	2,631
2015	-	-	-		0	1	2,656
2016	-	-	-		0	4	2,643
2017	-	-	-		0	17	2,634
2018	-	-	-		0	23	2,698
2019	-	-	-		0	22	2,739
2020	-	-	-		0	26	2,607
2021	-	-	-		0	25	2,590
2022	-	-	-		0	25	2,720
2023	-	-	-		0	25	2,769
2024	-	-	-		0	25	2,796
2025	-	-	-		0	25	2,811
2026	-	-	-		0	25	2,820
2027	-	-	-		0	25	2,829
2028	-	-	-		0	25	2,837
2029	-	-	-		0	25	2,848
2030	-	-	-		0	25	2,861
2031	-	-	-		0	25	2,871

[1] Average end-of-month customers for the calendar year.
[2] As of 2007 Security Lights and Street & Highway Lighting use is included with Commercial on Schedule 2.1.
[3] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[4] Values include DSM impacts.

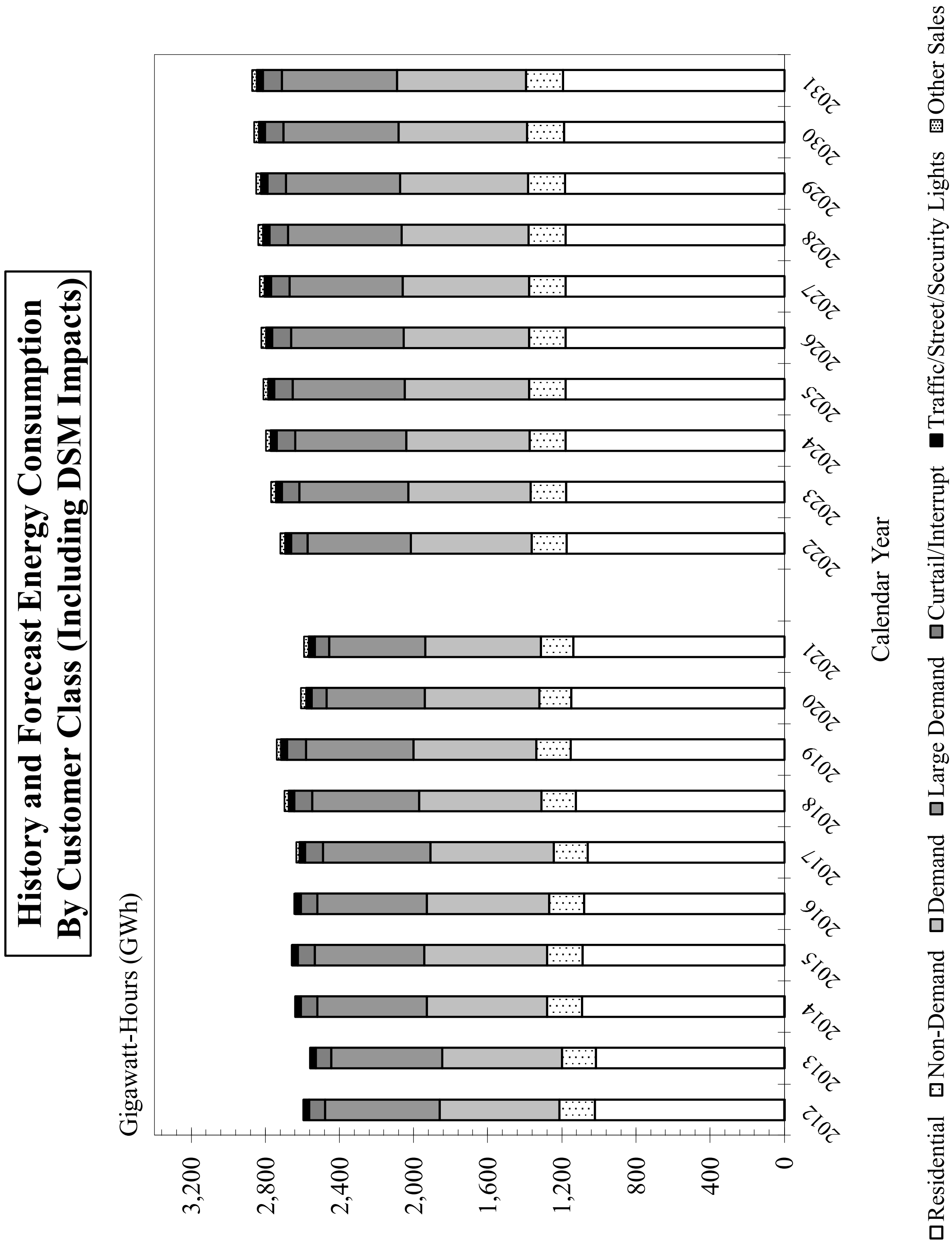
City Of Tallahassee

Schedule 2.3
History and Forecast of Energy Consumption and Number of Customers by Customer Class

Base Load Forecast

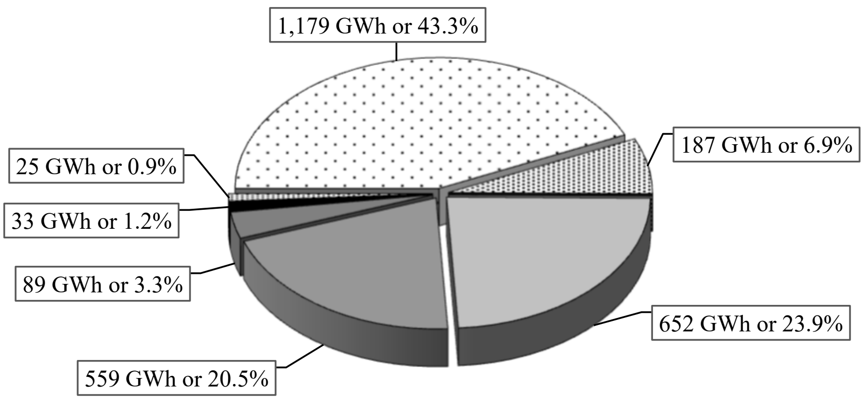
(1) Year	(2) Sales for Resale (GWh)	(3) Utility Use & Losses (GWh)	(4) Net Energy for Load (GWh) [1]	(5) Other Customers (Average No.)	(6) Total No. of Customers [2]
2012	0	124	2,710	0	114,924
2013	0	131	2,684	0	115,703
2014	0	121	2,751	0	116,708
2015	0	120	2,776	0	117,827
2016	0	135	2,779	0	119,005
2017	0	124	2,758	0	120,051
2018	0	126	2,824	0	121,677
2019	0	112	2,851	0	123,538
2020	0	121	2,728	0	125,478
2021	0	115	2,705	0	125,901
2022	0	122	2,842	0	127,400
2023	0	125	2,894	0	128,773
2024	0	133	2,929	0	130,077
2025	0	127	2,938	0	131,265
2026	0	128	2,948	0	132,348
2027	0	128	2,957	0	133,416
2028	0	135	2,972	0	134,460
2029	0	129	2,977	0	135,490
2030	0	129	2,990	0	136,539
2031	0	130	3,001	0	137,521

[1] Reflects NEL served by City electric system. Values include DSM Impacts.
[2] Average number of customers for the calendar year.


History and Forecast Energy Consumption
By Customer Class (Including DSM Impacts)
Gigawatt-Hours (GWh)
3,200
2,800
2,400
2,000
1,600
1,200
800
400
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Calendar Year
Residential
Non-Demand
Demand
Large Demand
Curtail/Interrupt
Traffic/Street/Security Lights
Other Sales

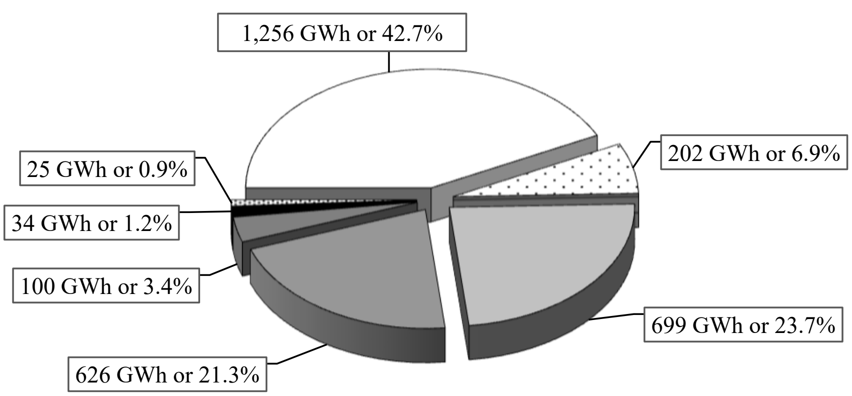
Energy Consumption By Customer Class (Excluding DSM Impacts)

Calendar Year 2022



2022 Total Sales = 2,724 GWh

Calendar Year 2031



2031 Total Sales = 2,942 GWh

- Residential
- Non-Demand
- Demand
- Large Demand
- Curtail/Interrupt
- Traffic/Street/Security Lights
- Other Sales

City Of Tallahassee

Schedule 3.1.1
History and Forecast of Summer Peak Demand
Base Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2]	(7) Residential Conservation [2], [3]	(8) Comm./Ind Load Management [2]	(9) Comm./Ind Conservation [2], [3]	(10) Net Firm Demand [1]
2012	557		557						557
2013	543		543						543
2014	565		565						565
2015	600		600						600
2016	597		597						597
2017	598		598						598
2018	596		596						596
2019	616		616						616
2020	576		576						576
2021	574		574		0	1	0	0	573
2022	610		610		0	1	0	0	609
2023	623		623		0	2	0	0	621
2024	631		631		0	3	0	1	627
2025	636		636		1	5	2	1	627
2026	640		640		2	6	4	2	626
2027	644		644		4	7	6	3	624
2028	647		647		5	8	8	3	623
2029	651		651		7	9	9	4	622
2030	656		656		7	11	9	5	624
2031	659		659		7	12	10	5	625

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2021 DSM is actual at peak.
[3] 2021 values reflect incremental increase from 2020.

City Of Tallahassee

Schedule 3.1.2
History and Forecast of Summer Peak Demand
High Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2]	(7) Residential Conservation [2], [3]	(8) Comm./Ind Load Management [2]	(9) Comm./Ind Conservation [2], [3]	(10) Net Firm Demand [1]
2012	590		590						590
2013	557		557						557
2014	543		543						543
2015	565		565						565
2016	600		600						600
2017	597		597						597
2018	598		598						598
2019	596		596						596
2020	616		616						616
2021	574		574		0	1	0	0	573
2022	620		620		0	1	0	0	619
2023	642		642		0	2	0	0	640
2024	657		657		0	3	0	1	653
2025	668		668		1	5	2	1	659
2026	678		678		2	6	4	2	664
2027	687		687		4	7	6	3	667
2028	694		694		5	8	8	3	670
2029	703		703		7	9	9	4	674
2030	712		712		7	11	9	5	680
2031	719		719		7	12	10	5	685

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2021 DSM is actual at peak.
[3] 2021 values reflect incremental increase from 2020.

City Of Tallahassee

Schedule 3.1.3
History and Forecast of Summer Peak Demand
Low Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2]	(7) Residential Conservation [2], [3]	(8) Comm./Ind Load Management [2]	(9) Comm./Ind Conservation [2], [3]	(10) Net Firm Demand [1]
2012	590		590						590
2013	557		557						557
2014	543		543						543
2015	565		565						565
2016	600		600						600
2017	597		597						597
2018	598		598						598
2019	596		596						596
2020	616		616						616
2021	574		574		0	1	0	0	573
2022	600		600		0	1	0	0	599
2023	603		603		0	2	0	0	601
2024	604		604		0	3	0	1	600
2025	602		602		1	5	2	1	593
2026	600		600		2	6	4	2	586
2027	599		599		4	7	6	3	579
2028	597		597		5	8	8	3	573
2029	596		596		7	9	9	4	567
2030	596		596		7	11	9	5	564
2031	594		594		7	12	10	5	560

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2021 DSM is actual at peak.
[3] 2021 values reflect incremental increase from 2020.

City Of Tallahassee

Schedule 3.2.1
History and Forecast of Winter Peak Demand
Base Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2], [3]	(7) Residential Conservation [2], [4]	(8) Comm./Ind Load Management [2], [3]	(9) Comm./Ind Conservation [2], [4]	(10) Net Firm Demand [1]
2012 -2013	480		480						480
2013 -2014	574		574						574
2014 -2015	556		556						556
2015 -2016	511		511						511
2016 -2017	533		533						533
2017 -2018	621		621						621
2018 -2019	508		508						508
2019 -2020	528		528						528
2020 -2021	505		505						504
2021 -2022	539		539		0	1	0	0	538
2022 -2023	570		570		0	3	0	0	567
2023 -2024	576		576		0	4	0	1	571
2024 -2025	581		581		0	6	0	1	574
2025 -2026	584		584		0	7	0	1	576
2026 -2027	589		589		0	9	0	2	578
2027 -2028	592		592		0	10	0	2	580
2028 -2029	594		594		0	10	0	2	582
2029 -2030	599		599		0	11	0	3	585
2030 -2031	602		602		0	12	0	3	587
2031 -2032	606		606		0	13	0	3	590

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2021-2022 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2021-2022 values reflect incremental increase from 2020-2021.

City Of Tallahassee

Schedule 3.2.2
History and Forecast of Winter Peak Demand
High Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2], [3]	(7) Residential Conservation [2], [4]	(8) Comm./Ind Load Management [2], [3]	(9) Comm./Ind Conservation [2], [4]	(10) Net Firm Demand [1]
2012 -2013	480		480						480
2013 -2014	574		574						574
2014 -2015	556		556						556
2015 -2016	511		511						511
2016 -2017	533		533						533
2017 -2018	621		621						621
2018 -2019	508		508						508
2019 -2020	528		528						528
2020 -2021	505		505						504
2021 -2022	539		539		0	1	0	0	538
2022 -2023	584		584		0	3	0	0	581
2023 -2024	598		598		0	4	0	1	593
2024 -2025	609		609		0	6	0	1	602
2025 -2026	617		617		0	7	0	1	609
2026 -2027	627		627		0	9	0	2	616
2027 -2028	634		634		0	10	0	2	622
2028 -2029	641		641		0	10	0	2	629
2029 -2030	649		649		0	11	0	3	635
2030 -2031	657		657		0	12	0	3	642
2031 -2032	664		664		0	13	0	3	648

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2021-2022 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2021-2022 values reflect incremental increase from 2020-2021.

City Of Tallahassee

Schedule 3.2.3
History and Forecast of Winter Peak Demand
Low Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2], [3]	(7) Residential Conservation [2], [4]	(8) Comm./Ind Load Management [2], [3]	(9) Comm./Ind Conservation [2], [4]	(10) Net Firm Demand [1]
2012 -2013	480		480						480
2013 -2014	574		574						574
2014 -2015	556		556						556
2015 -2016	511		511						511
2016 -2017	533		533						533
2017 -2018	621		621						621
2018 -2019	508		508						508
2019 -2020	528		528						528
2020 -2021	505		505						504
2021 -2022	539		539		0	1	0	0	538
2022 -2023	555		555		0	3	0	0	552
2023 -2024	554		554		0	4	0	1	549
2024 -2025	553		553		0	6	0	1	546
2025 -2026	550		550		0	7	0	1	542
2026 -2027	549		549		0	9	0	2	538
2027 -2028	549		549		0	10	0	2	537
2028 -2029	546		546		0	10	0	2	534
2029 -2030	546		546		0	11	0	3	532
2030 -2031	545		545		0	12	0	3	530
2031 -2032	544		544		0	13	0	3	528

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2021-2022 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2021-2022 values reflect incremental increase from 2020-2021.

City Of Tallahassee

Schedule 3.3.1
History and Forecast of Annual Net Energy for Load
Base Forecast
(GWh)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total Sales	Residential Conservation [1]	Comm./Ind Conservation [1]	Retail Sales [2], [3]	Wholesale [4]	Utility Use & Losses	Net Energy for Load [3], [5]	Load Factor % [3]
2012	2,593			2,593	(7)	124	2,710	55
2013	2,558			2,558	(5)	131	2,684	56
2014	2,637			2,637	(7)	121	2,751	56
2015	2,655			2,655	1	120	2,776	53
2016	2,640			2,640	4	135	2,779	53
2017	2,617			2,617	17	124	2,758	53
2018	2,675			2,675	23	126	2,824	54
2019	2,716			2,716	22	112	2,851	53
2020	2,584			2,581	26	121	2,728	54
2021	2,570	4	0	2,566	25	115	2,705	54
2022	2,699	5	0	2,694	25	122	2,842	53
2023	2,755	10	1	2,744	25	125	2,894	53
2024	2,788	16	1	2,771	25	133	2,929	53
2025	2,812	24	2	2,786	25	127	2,938	53
2026	2,830	32	3	2,795	25	127	2,948	54
2027	2,849	41	4	2,804	25	128	2,957	54
2028	2,866	49	5	2,812	25	135	2,972	54
2029	2,883	54	6	2,823	25	129	2,977	55
2030	2,901	59	7	2,835	25	129	2,990	55
2031	2,917	64	7	2,846	25	130	3,001	55

[1] Reduction estimated at customer meter. 2021 DSM is actual incremental increase from 2020.
[2] History is total sales to City customers. Forecast is sales served by City electric system.
[3] Values include DSM Impacts.
[4] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[5] Reflects NEL served by City electric system.

City Of Tallahassee

Schedule 3.3.2
History and Forecast of Annual Net Energy for Load
High Forecast
(GWh)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total Sales	Residential Conservation [1]	Comm./Ind Conservation [1]	Retail Sales [2], [3]	Wholesale [4]	Utility Use & Losses	Net Energy for Load [3], [5]	Load Factor % [3]
2012	2,593			2,593	(7)	124	2,710	55
2013	2,558			2,558	(5)	131	2,684	56
2014	2,637			2,637	(7)	121	2,751	56
2015	2,655			2,655	1	120	2,776	53
2016	2,640			2,640	4	135	2,779	53
2017	2,617			2,617	17	124	2,758	53
2018	2,675			2,675	23	126	2,824	54
2019	2,716			2,716	22	112	2,851	53
2020	2,584			2,581	26	121	2,728	54
2021	2,570	4	0	2,566	25	115	2,705	54
2022	2,735	5	0	2,730	25	124	2,879	53
2023	2,838	10	1	2,827	25	128	2,981	53
2024	2,903	16	1	2,886	25	138	3,049	53
2025	2,953	24	2	2,927	25	133	3,086	53
2026	2,996	32	3	2,961	25	135	3,121	54
2027	3,036	41	4	2,991	25	136	3,152	54
2028	3,073	49	5	3,019	25	144	3,188	54
2029	3,109	54	6	3,049	25	139	3,213	54
2030	3,147	59	7	3,081	25	140	3,246	55
2031	3,181	64	7	3,110	25	142	3,277	55

[1] Reduction estimated at customer meter. 2021 DSM is actual incremental increase from 2020.
[2] History is total sales to City customers. Forecast is sales served by City electric system.
[3] Values include DSM Impacts.
[4] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[5] Reflects NEL served by City electric system.

City Of Tallahassee

Schedule 3.3.3
History and Forecast of Annual Net Energy for Load
Low Forecast
(GWh)

(1) Year	(2) Total Sales	(3) Residential Conservation [1]	(4) Comm./Ind Conservation [1]	(5) Retail Sales [2], [3]	(6) Wholesale [4]	(7) Utility Use & Losses	(8) Net Energy for Load [3], [5]	(9) Load Factor % [3]
2012	2,593			2,593	(7)	124	2,710	55
2013	2,558			2,558	(5)	131	2,684	56
2014	2,637			2,637	(7)	121	2,751	56
2015	2,655			2,655	1	120	2,776	53
2016	2,640			2,640	4	135	2,779	53
2017	2,617			2,617	17	124	2,758	53
2018	2,675			2,675	23	126	2,824	54
2019	2,716			2,716	22	112	2,851	53
2020	2,584			2,581	26	121	2,728	54
2021	2,570	4	0	2,566	25	115	2,705	54
2022	2,654	5	0	2,649	25	126	2,801	53
2023	2,671	10	1	2,660	25	121	2,807	53
2024	2,674	16	1	2,657	25	127	2,809	53
2025	2,669	24	2	2,643	25	120	2,789	54
2026	2,663	32	3	2,628	25	120	2,773	54
2027	2,657	41	4	2,612	25	119	2,756	54
2028	2,653	49	5	2,599	25	124	2,749	55
2029	2,648	54	6	2,588	25	118	2,731	55
2030	2,644	59	7	2,578	25	117	2,721	55
2031	2,638	64	7	2,567	25	117	2,709	55

[1] Reduction estimated at customer meter. 2021 DSM is actual incremental increase from 2020.
[2] History is total sales to City customers. Forecast is sales served by City electric system.
[3] Values include DSM Impacts.
[4] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin)
[5] Reflects NEL served by City electric system.

City Of Tallahassee

Schedule 4
Previous Year and 2-Year Forecast of Retail Peak Demand and Net Energy for Load by Month

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2021 Actual		**2022 Forecast [1][2]**		**2023 Forecast [1]**	
Month	Peak Demand (MW)	NEL (GWh)	Peak Demand (MW)	NEL (GWh)	Peak Demand (MW)	NEL (GWh)
January	504	227	558	231	567	235
February	500	195	497	200	505	203
March	409	199	443	202	452	207
April	416	192	443	207	453	212
May	497	228	525	243	536	248
June	557	252	569	264	580	269
July	573	272	595	288	606	294
August	559	280	609	292	621	298
September	524	246	560	261	571	266
October	459	223	492	229	498	232
November	421	194	454	203	459	206
December	396	197	484	222	488	224
TOTAL		2,705		2,842		2,894

[1] Peak Demand and NEL include DSM Impacts.
[2] Represents forecast values for 2022.

City of Tallahassee, Florida

2022 Electric System Load Forecast

Key Explanatory Variables

	Forecast Model								
Explanatory Variable	RS Customers	RS Consumption	GSND Customers	GSND Consumption	GSD Customers	GSD Consumption	GSLD Consumption	System Losses	Monthly Load Factor [3]
Leon County Population	X			X	X	X			
Leon County Personal Income			X				X		
Leon County Gross Product									
Leon County Non-Store Sales				X			X		
Tallahassee MSA Taxable Sales				X					
Tallahassee MSA Per Capita Taxable Sales		X							
Residential Customers		X							
Florida Mortgage Originations	X								
Florida Home Vacancies	X								
US Personal Spending			X				X		
Energy Efficiency Standards		X							
Price of Electricity		X							
Leon County Residential Location Prevalence		X							
Leon County Commercial Location Prevalence				X		X	X		X
Cooling Degree Days [1]		X		X		X	X	X	X
Heating Degree Days [1]		X		X				X	X
Prior Month Cooling Degree Days [1]								X	
Prior Month Heating Degree Days [1]								X	
Winter Peak and Prior Day HDD [1]									X
Summer Peak and Prior Day HDD [1]									X
Adjusted R-Squared [2]	0.998	0.927	0.990	0.991	0.981	0.949	0.869	0.877	0.704

[1] The base from which monthly heating and cooling degree days (HDD/CDD, respectively) are computed is 65 degrees Fahrenheit (dF). Peak day HDD and CDD reflect differing bases. For winter peak HDD the base is 55 degrees Fahrenheit (^{o}F); for summer peak CDD the base is 70^{o}F.

[2] R-Squared, sometimes called the coefficient of determination, is a commonly used measure of goodness of fit of a linear model. If all observations fall on the model regression line, R Squared is 1. If there is no linear relationship between the dependent and independent variable, R Squared is 0. Adjusted R-Squared reflects a downward adjustment to penalize R-squared for the addition of regressors that do not contribute to the explanatory power of the model.

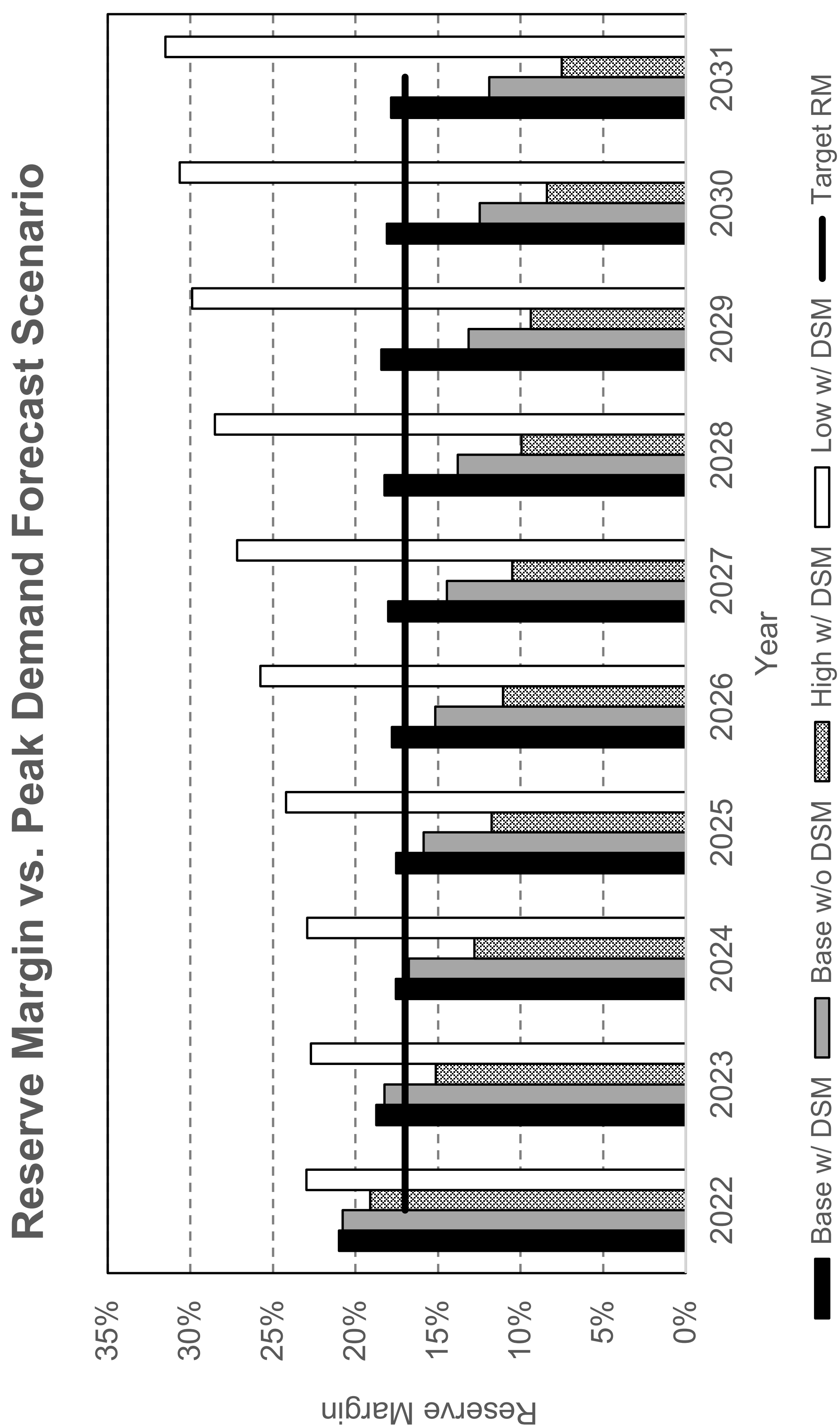
[3] As monthly load factor is essentially a stationary series, indicators of goodness of fit should be viewed differently. In combination with estimates of NEL, forecasted peak demands from this equation will have far better fit than the adjusted R-Squared here indicates. The equation also includes daytype variables.

City of Tallahassee

2022 Electric System Load Forecast

Sources of Forecast Model Input Information

Energy Model Input Data	Source
Leon County Population	Bureau of Economic and Business Research Woods and Poole Economics
Leon County Personal Income	Woods and Poole Economics
Leon County Gross Product	Woods and Poole Economics
Leon County Non-Store Sales	Woods and Poole Economics
Cooling Degree Days	NOAA
Heating Degree Days	NOAA
AC Saturation Rate	Appliance Saturation Study; EIA
Heating Saturation Rate	Appliance Saturation Study; EIA
Real Tallahassee Taxable Sales	Florida Department of Revenue, CPI Woods and Poole Economics
Real Tallahassee Taxable Sales Per Capita	Florida Department of Revenue, CPI Woods and Poole Economics
Florida Population	Bureau of Economic and Business Research Woods and Poole Economics
Florida Home Vacancy Rate	U.S. Bureau of the Census
Florida Mortgage Originations	IHS Global Insight (now IHS Markit)
U.S. Personal Spending Rate	U.S. Bureau of Economic Analysis
State Capitol Incremental	Department of Management Services
FSU Incremental Additions	FSU Planning Department
FAMU Incremental Additions	FAMU Planning Department
GSLD Incremental Additions	City Utility Services
Other Commercial Customers	City Utility Services
Tall. Memorial Curtailable	City Utility Services
System Peak Historical Data	City System Planning
Historical Customer Projections by Class	City Utility Services
Historical Customer Class Energy	City Utility Services
Interruptible, Traffic Light Sales, & Security Light Additions	City Utility Services
Residential/Commercial Real Price of Electricity	Calculated from Revenues, kWh sold, CPI 2021 Annual Energy Outlook
Leon County Residential Location Prevalence	Published by Google
Leon County Commercial Location Prevalence	Published by Google


Reserve Margin vs. Peak Demand Forecast Scenario
Reserve Margin
35%
30%
25%
20%
15%
10%
5%
0%
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Year
Base w/ DSM
Base w/o DSM
High w/ DSM
Low w/ DSM
Target RM

City Of Tallahassee

2022 Electric System Load Forecast

Projected Demand Side Management Energy Reductions [1]

Calendar Year	Residential Impact (MWh)	Commercial Impact (MWh)	Total Impact (MWh)
2022	4,860	253	5,114
2023	10,052	524	10,576
2024	17,217	1,312	18,529
2025	24,940	2,253	27,193
2026	33,324	3,262	36,586
2027	42,638	4,356	46,994
2028	51,346	5,508	56,855
2029	56,380	6,147	62,527
2030	61,515	6,796	68,312
2031	66,651	7,422	74,073

[1] Reductions estimated at generator busbar.

City Of Tallahassee

2022 Electric System Load Forecast

Projected Demand Side Management
Seasonal Demand Reductions [1]

Year		Residential Energy Efficiency Impact		Commercial Energy Efficiency Impact		Residential Demand Response Impact		Commercial Demand Response Impact		Demand Side Management Total	
Summer	Winter	Summer (MW)	Winter (MW)	Summer (MW)	Winter (MW)	Summer (MW)	Winter [2] (MW)	Summer (MW)	Winter [2] (MW)	Summer (MW)	Winter (MW)
2022	2022-2023	1	3	0	0	0	0	0	0	1	3
2023	2023-2024	2	4	0	1	0	0	0	0	2	5
2024	2024-2025	3	6	1	1	0	0	0	0	4	7
2025	2025-2026	5	7	1	1	1	0	2	0	9	8
2026	2026-2027	6	9	2	2	2	0	4	0	14	11
2027	2027-2028	7	10	3	2	4	0	6	0	20	12
2028	2028-2029	8	10	3	2	5	0	8	0	24	12
2029	2029-2030	9	11	4	3	7	0	9	0	29	14
2030	2030-2031	11	12	5	3	7	0	9	0	32	15
2031	2031-2032	12	13	5	3	7	0	10	0	34	16

[1] Reductions estimated at busbar.
[2] Reflects no expected utilization of demand response (DR) resources in winter.

City Of Tallahassee

Schedule 5
Fuel Requirements

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Fuel Requirements		Units	Actual 2020	Actual 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
(1)	Nuclear		Billion Btu	0	0	0	0	0	0	0	0	0	0	0	0
(2)	Coal		1000 Ton	0	0	0	0	0	0	0	0	0	0	0	0
(3)	Residual	Total	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(4)		Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(5)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(6)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(7)		Diesel	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(8)	Distillate	Total	1000 BBL	0	2	0	0	0	0	0	0	0	0	0	0
(9)		Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(10)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(11)		CT	1000 BBL	0	2	0	0	0	0	0	0	0	0	0	0
(12)		Diesel	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(13)	Natural Gas	Total	1000 MCF	20,725	21,344	22,588	22,781	22,579	22,977	23,024	22,472	22,917	23,140	23,057	23,244
(14)		Steam	1000 MCF	0	0	0	0	0	0	0	0	0	0	0	0
(15)		CC	1000 MCF	17,975	18,318	21,694	21,720	20,898	21,829	21,852	20,640	21,435	21,912	21,476	21,936
(16)		CT	1000 MCF	2,749	3,027	894	1,062	1,680	1,148	1,172	1,832	1,482	1,229	1,581	1,308
(17)		Diesel	1000 MCF	0	0	0	0	0	0	0	0	0	0	0	0
(18)	Other (Specify)		Trillion Btu	0	0	0	0	0	0	0	0	0	0	0	0

City Of Tallahassee

Schedule 6.1
Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Energy Sources		Units	Actual 2020	Actual 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
(1)	Annual Firm Interchange		GWh	0	0	0	0	0	0	0	0	0	0	0	0
(2)	Coal		GWh	0	0	0	0	0	0	0	0	0	0	0	0
(3)	Nuclear		GWh	0	0	0	0	0	0	0	0	0	0	0	0
(4)	Residual	Total	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(5)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(6)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(7)		CT	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(8)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(9)	Distillate	Total	GWh	0	1	0	0	0	0	0	0	0	0	0	0
(10)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(11)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(12)		CT	GWh	0	1	0	0	0	0	0	0	0	0	0	0
(13)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(14)	Natural Gas	Total	GWh	2,666	2,764	2,931	2,959	2,938	2,987	2,994	2,926	2,980	3,010	3,003	3,024
(15)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(16)		CC	GWh	2,346	2,520	2,826	2,834	2,740	2,852	2,856	2,710	2,806	2,866	2,817	2,870
(17)		CT	GWh	320	244	106	125	198	135	138	215	174	144	186	154
(18)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(19)	Hydro		GWh	0	0	0	0	0	0	0	0	0	0	0	0
(20)	Economy Interchange[1]		GWh	(51)	(159)	(210)	(185)	(129)	(168)	(164)	(87)	(126)	(150)	(129)	(138)
(21)	Renewables		GWh	113	99	121	121	120	119	119	118	118	117	116	116
(22)	Net Energy for Load		GWh	2,728	2,705	2,842	2,894	2,929	2,938	2,948	2,957	2,972	2,977	2,990	3,001

[1] Negative values reflect expected need to sell excess off-peak power to satisfy generator minimum load requirements, primarily in winter and shoulder mon

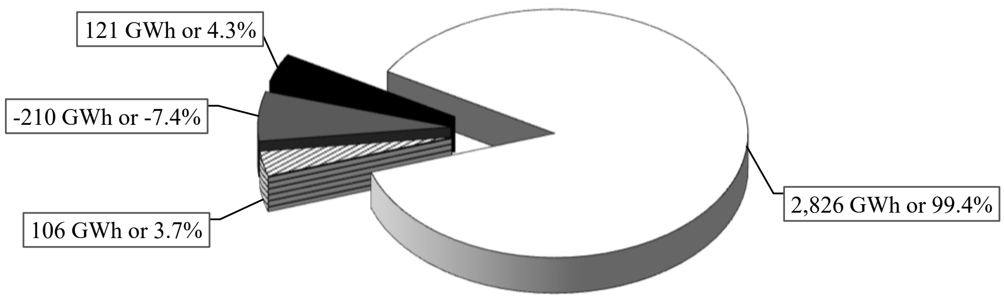
City Of Tallahassee

Schedule 6.2
Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Energy Sources		Units	Actual 2020	Actual 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
(1)	Annual Firm Interchange		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(2)	Coal		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3)	Nuclear		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(4)	Residual	Total	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(5)		Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(6)		CC	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(7)		CT	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(8)		Diesel	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(9)	Distillate	Total	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(10)		Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(11)		CC	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(12)		CT	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(13)		Diesel	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(14)	Natural Gas	Total	%	97.7	102.2	103.1	102.2	100.3	101.7	101.5	98.9	100.3	101.1	100.4	100.8
(15)		Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(16)		CC	%	86.0	93.2	99.4	97.9	93.5	97.1	96.9	91.7	94.4	96.3	94.2	95.6
(17)		CT	%	11.7	9.0	3.7	4.3	6.7	4.6	4.7	7.3	5.9	4.9	6.2	5.1
(18)		Diesel	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(19)	Hydro		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(20)	Economy Interchange		%	(1.9)	(5.9)	(7.4)	(6.4)	(4.4)	(5.7)	(5.6)	(2.9)	(4.2)	(5.0)	(4.3)	(4.6)
(21)	Renewables		%	4.1	3.7	4.3	4.2	4.1	4.1	4.0	4.0	4.0	3.9	3.9	3.9
(22)	Net Energy for Load		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

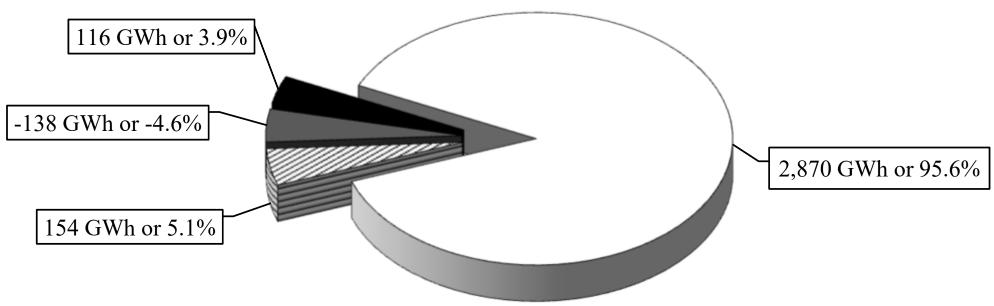
Generation By Resource/Fuel Type

Calendar Year 2022

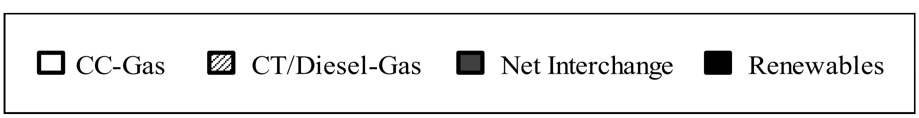


2022 Total NEL = 2,842 GWh

Calendar Year 2031



2031 Total NEL = 3,001 GWh



Chapter III

Projected Facility Requirements

3.1 PLANNING PROCESS

The City periodically reviews future DSM and power supply options that are consistent with the City's policy objectives. Included in these reviews are analyses of how the DSM and power supply alternatives perform under base and alternative assumptions. Revisions to the City's resource plan will be discussed in this chapter.

3.2 PROJECTED RESOURCE REQUIREMENTS

3.2.1 TRANSMISSION LIMITATIONS

The City's projected transmission import and export capability continues to be a major determinant of the type and timing of future power supply resource additions. The City's internal transmission studies have reflected a gradual deterioration of the system's transmission import and export capability into the future, due to the expected configuration and use, both scheduled and unscheduled, of the City's transmission system and the surrounding regional transmission system. The City has worked with its neighboring utilities, Duke and Southern, to plan and maintain, at minimum, sufficient transmission import capability to allow the City to make emergency power purchases in the event of the most severe single contingency, the loss of the system's largest generating unit, and sufficient export capability to allow for the sale of incidental and/or economic excess local generation.

The prospects for significant expansion of the regional transmission system around Tallahassee hinges on the City's ongoing discussions with Duke and Southern, the Florida Reliability Coordinating Council's (FRCC) regional transmission planning process, and the evolving set of mandatory reliability standards issued by the North American Electric Reliability Corporation (NERC). However, no substantive improvements to the City's transmission import/export capability are expected absent the City's prospective purchase of firm transmission service. In consideration of the City's limited transmission import capability internal analysis of options tend to favor local power supply alternatives as the means to satisfy future power supply requirements.

3.2.2 Reserve Requirements

For the purposes of this year's TYSP report the City uses a load reserve margin of 17% as its resource adequacy criterion. This margin was established in the 1990s then re-evaluated via a loss of load probability (LOLP) analysis of the City's system performed in 2002. The City periodically conducts probabilistic resource adequacy assessments to determine if conditions warrant a change to its resource adequacy criteria. The results of more recent analyses suggest that reserve margin may no longer be suitable as the City's sole resource adequacy criterion. This issue is discussed further in Section 3.2.4.

3.2.3 Recent and Near Term Resource Changes

In 2018, the City placed two 9.2 MW (net) Wartsila natural gas-fired RICE generators into commercial operations at its Substation 12. This substation has a single transmission feed. The addition of this generation at the substation allows for back-up of critical community loads served from Substation 12 as well as provide additional generation resources to the system. Also in 2018, the City completed construction of four 18.5 MW (net) Wartsila natural gas-fired RICE generators located at its Hopkins Generating Station. Three of these units were placed into commercial operations in February 2019 and the fourth in March 2019. A fifth 18.5 MW RICE unit was placed into commercial operations in April 2020.

The RICE generators provide additional benefits including but not necessarily limited to:

- Multiple RICE generators provide greater dispatch flexibility.
- Additional RICE generators can be installed at either the City's Hopkins plant or split between the Hopkins plant and Purdom plant.
- The RICE generators are more efficient than the units that were retired providing significant potential fuel savings.
- The RICE generators can be started and reach full load within 5-10 minutes. In addition, their output level can be changed very rapidly. This, coupled with the number and size of each unit, makes them excellent for responding to the changes in output from intermittent resources such as solar energy systems.

- The CO_2 emissions from the RICE generators are much lower than the units that have been retired.
- The City's former Hopkins Unit 1 had a minimum up time requirement of 100 hours. This at times required the unit to remain on line during daily off-peak periods when the unit's generation was not needed and/or represented excess generation that had to be sold, sometimes at a loss. Replacing Hopkins Unit 1 with the smaller, "quick start" RICE generators allows the City to avoid this uneconomic operating practice.
- By retiring Hopkins Unit 1 earlier and advancing the in-service dates of these RICE generators analyses indicated that some of the associated debt service would be offset by the fuel savings from the efficiency gains achieved.

Expected future resource additions are discussed in Section 3.2.6, "Future Power Supply Resources".

3.2.4 Power Supply Diversity

Resource diversity, and particularly fuel diversity, has long been a priority concern for the City because of the system's heavy reliance on natural gas as its primary fuel source. This issue has received even greater emphasis due to the historical volatility in natural gas prices. The City has addressed this concern in part by implementing an Energy Risk Management (ERM) program to limit the City's exposure to energy price fluctuations. The ERM program established an organizational structure of interdepartmental committees and working groups and included the adoption of an Energy Risk Management Policy. This policy identifies acceptable risk mitigation products to prevent asset value losses, ensure price stability and provide protection against market volatility for fuels and energy to the City's electric and gas utilities and their customers.

Other important considerations in the City's planning process are the diversity of power supply resources in terms of their number, sizes and expected duty cycles as well as expected transmission import capabilities. To satisfy expected electric system requirements the City currently assesses the adequacy of its power supply resources versus the 17% load reserve margin criterion. But the evaluation of reserve margin is made only for the annual electric system peak demand and assuming all power supply resources are available. Resource adequacy must also be evaluated during other times of the year to determine if the City is maintaining the appropriate amount and mix of power supply resources. Further, consideration must be given to the adequacy of resources' ability to provide ancillary services (voltage control, frequency response, regulating/operating/contingency reserves, etc.). Because of the high variability of load requirements at the National High Magnetic Field Laboratory (NHMFL) and the increasing penetration of intermittent, utility-scale solar PV projects, ensuring ancillary service adequacy is becoming increasingly important.

Currently, over 70% of the City's power supply comes from two generating units, Purdom 8 and Hopkins 2. The outage of either of these units can present operational challenges especially when coupled with transmission limitations (as discussed in Section 3.2.1). Further, the replacement of older generating units has altered the number and sizes of power supply resources available to ensure resource adequacy throughout the reporting period. For these reasons the City has evaluated alternative and/or supplemental probabilistic metrics/criteria to its current load reserve margin criterion that may better balance resource and ancillary service adequacy with utility and customer costs. The results of this evaluation confirmed that the City's current capacity mix and limited transmission import capability are the biggest determinants of the City's resource adequacy and suggest that there are risks of potential resource shortfalls during periods other than at the time of the system peak demand. Therefore, the City's current deterministic load reserve margin criterion may need to be replaced with and/or supplemented by other criteria that takes these issues into consideration.

Purchase contracts can provide some of the diversity desired in the City's power supply resource portfolio. The City has evaluated both short and long-term purchased power options based on conventional sources as well as power offers based on renewable resources. The potential reliability and economic benefits of prospectively increasing the City's transmission import (and export) capabilities has also been evaluated. These evaluations indicate the potential for some electric reliability improvement resulting from the addition of facilities to achieve more transmission import capability. However, the study's model of the Southern and Florida markets reflects, as with the City's generation fleet, natural gas-fired generation on the margin most of the time. Therefore, the cost of increasing the City's transmission import capability would not likely be offset by the potential economic benefit from increased power purchase/sale opportunities.

As an additional strategy to address the City's lack of power supply diversity, planning staff has investigated options for a significantly enhanced DSM portfolio. Commitment to this expanded DSM effort (see Section 2.1.3) and an increase in customer-sited renewable energy projects (primarily solar photovoltaics) improve the City's overall resource diversity. However, due to limited availability and uncertain performance, past studies have indicated that traditional DSM and solar projects would not improve resource adequacy (as measured by loss of load expectation (LOLE)) as much as the addition of conventional generation resources.

3.2.5 Renewable Resources

The City believes that offering clean, renewable energy alternatives to its customers is a sound business strategy: it will provide for a measure of supply diversification, reduce dependence on fossil fuels, promote cleaner energy sources, and enhance the City's already strong commitment to protecting the environment and the quality of life in Tallahassee. The City continues to seek suitable projects that utilize the renewable fuels available within the Florida Big Bend and panhandle regions. As part of its continuing commitment to explore clean energy alternatives, the City has continued to invest in opportunities to develop viable solar photovoltaic (PV) projects as part of our efforts to offer "green power" to our customers.

On July 24, 2016, the City executed a PPA for 20 MW_{ac} of solar PV with Origis Energy USA ("Origis"), doing business as FL Solar 1 (Solar Farm 1). The project is located adjacent to the Tallahassee International Airport and delivers power to a City-owned distribution facility. The City declared commercial operations of the project on December 13, 2017. In an effort to increase the use of renewables, the City entered into a PPA with Origis, doing business as FL Solar 4 (Solar Farm 4) for a second project with an output of 42 MW_{ac}. The Solar Farm 4 project is sited on additional property adjacent to the Tallahassee International Airport and connected to the City's 230 kV transmission system. The commercial operations date for Solar Farm 4 was December 26, 2019 bringing the City's total utility-scale solar capacity to 62 MW_{ac}.

The City has conducted analyses of the output of the Solar Farm 1 and Solar Farm 4 facilities that revealed that neither contribute to meeting the winter peaks but do contribute towards meeting the summer peaks. Based on these analyses, an average of approximately 50% of the facilities' total installed capacity has been available during summer peak and near peak hours. However, given the limited operational experience with these resources, the City has elected to utilize a more conservative initial estimate of 20% of the combined capacity of the facilities as firm capacity available for the summer peak. The City will continue to review and, if appropriate, revise the assumed firm contribution from its solar power supply resources as additional operational experience is gained.

One of the potential negatives of the having both projects located adjacent to each other is that both systems will likely experience cloud cover at the same time. The intermittent nature of solar PV coupled with the high variability of FSU's National High Magnetic Field Laboratory (NHMFL) load could at times present challenges to the provision of sufficient regulating reserves. The City will continue to monitor the proliferation of PV and other intermittent resources and work to integrate them so that service reliability is not jeopardized. The "quick start" capability of the reciprocating engine/generators commissioned in 2019 and 2020 may help mitigate the intermittency of the solar resources the NHMFL load while contributing to the ongoing modernization of the City's generation fleet.

As of the end of calendar year 2021 the City has a portfolio of 223 kW_{ac} of solar PV operated and maintained by the Electric Utility and a cumulative total of 4,746 kW_{ac} of solar PV has been installed by customers. The City promotes and encourages environmental responsibility in our community through a variety of programs available to citizens. The commitment to renewable energy sources (and particularly to solar PV) by its customers is made possible through the Sustainability initiative, that includes many options related to becoming a greener community such as the City's Solar PV Net Metering offer. Solar PV Net Metering promotes customer investment in renewable energy generation by allowing residential and commercial customers with small to moderate sized PV installations to return excess generated power back to the City at the full retail value.

The City commissioned a study to determine the impacts of additional intermittent renewable resources being added to the City's system. The study was completed in 2019 and determined that the maximum expected intermittent resource penetration the system can handle without adversely impacting the reliability of the system from both a bulk power and distribution perspective to be 60 MW_{ac}. In addition, the study identified potential system modifications that may be available to increase the amount of intermittent resources that can be reliably added to the system.

On February 20, 2019, the City Commission adopted a Clean Energy Plan (CEP) resolution. The CEP resolution outlined the City's continued commitment to sustainability and established the following specific goals:

- All City facilities to be 100% renewable no later than 2035.
- All City main line buses to be 100% electric no later than 2035.
- All City light duty vehicles to be 100% electric no later than 2035
- All City medium and heavy duty vehicles converted to 100% electric as technology allows.
- No later than 2050, have the Tallahassee community at 100% renewable, including all forms of energy. This would include the electric utility, natural gas utility and transportation.

The City issued a Request for Proposals (RFP) for consulting services related to the Energy Integrated Resource Planning (EIRP) process and public engagement plan to identify the path forward to meet the 2050 100% clean, renewable energy goal. The City executed a contract with the top-ranked RFP respondent in June 2020. The resulting Clean Energy Plan is expected to be complete in late 2022.

3.2.6 Future Power Supply Resources

The City's 2022 Ten Year Site Plan identifies that no additional power supply resources will be needed through the 2031 horizon year. .

The suitability of this resource plan is dependent on the performance of the City's DSM portfolio (described in Section 2.1.3 of this report) and the City's projected transmission import capability. If only 50% of the projected annual DSM peak demand reductions are achieved, the City would require about 15 MW of additional power supply resources to meet its load and planning reserve requirements through the horizon year of 2031. The City continues to monitor closely the performance of the DSM portfolio and, as mentioned in Section 2.1.3, will be revisiting and, where appropriate, updating assumptions regarding and re-evaluating cost-effectiveness of our current and prospective DSM measures. This will also allow a reassessment of expected demand and energy savings attributable to DSM.

Tables 3.1 and 3.2 (Schedules 7.1 and 7.2) provide information on the resources and reserve margins during the next ten years for the City's system. The City has identified no planned capacity changes on Table 3.3 (Schedule 8). All existing capacity resources have been incorporated into the City's dispatch simulation model in order to provide information related to fuel consumption and energy mix (see Tables 2.18, 2.19 and 2.20). Figure C compares seasonal net peak load and the system reserve margin based on summer peak load requirements. Table 3.4 provides the City's generation expansion plan for the period from 2022 through 2031.

City Of Tallahassee

Schedule 7.1
Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Summer Peak [1]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	QF [2]	Total Capacity Available	System Firm Summer Peak Demand	Reserve Margin Before Maintenance		Scheduled Maintenance	Reserve Margin After Maintenance	
Year	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	% of Peak	(MW)	(MW)	% of Peak
2022	725	0	0	12	737	609	128	21	0	128	21
2023	725	0	0	12	737	621	116	19	0	116	19
2024	725	0	0	12	737	627	110	18	0	110	18
2025	725	0	0	12	737	627	110	18	0	110	18
2026	725	0	0	12	737	626	111	18	0	111	18
2027	725	0	0	12	737	624	113	18	0	113	18
2028	725	0	0	12	737	623	114	18	0	114	18
2029	725	0	0	12	737	622	115	18	0	115	18
2030	725	0	0	12	737	624	113	18	0	113	18
2031	725	0	0	12	737	625	112	18	0	112	18

[1] All installed and firm import capacity changes are identified in the proposed generation expansion plan (Table 3.4).
[2] Approximately 20% of Solar Farms 1 and 4 combined rated AC summer capacity.

City Of Tallahassee

Schedule 7.2
Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Winter Peak [1]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
							Reserve Margin Before Maintenance			Reserve Margin After Maintenance	
Year	Total Installed Capacity (MW)	Firm Capacity Import (MW)	Firm Capacity Export (MW)	QF (MW)	Total Capacity Available (MW)	System Firm Winter Peak Demand (MW)	(MW)	% of Peak	Scheduled Maintenance (MW)	(MW)	% of Peak
2022/23	795	0	0	0	795	567	228	40	0	228	40
2023/24	795	0	0	0	795	571	224	39	0	224	39
2024/25	795	0	0	0	795	574	221	39	0	221	39
2025/26	795	0	0	0	795	576	219	38	0	219	38
2026/27	795	0	0	0	795	578	217	38	0	217	38
2027/28	795	0	0	0	795	580	215	37	0	215	37
2028/29	795	0	0	0	795	582	213	37	0	213	37
2029/30	795	0	0	0	795	585	210	36	0	210	36
2030/31	795	0	0	0	795	587	208	35	0	208	35
2031/32	795	0	0	0	795	590	205	35	0	205	35

[1] All installed and firm import capacity changes are identified in the proposed generation expansion plan (Table 3.4).

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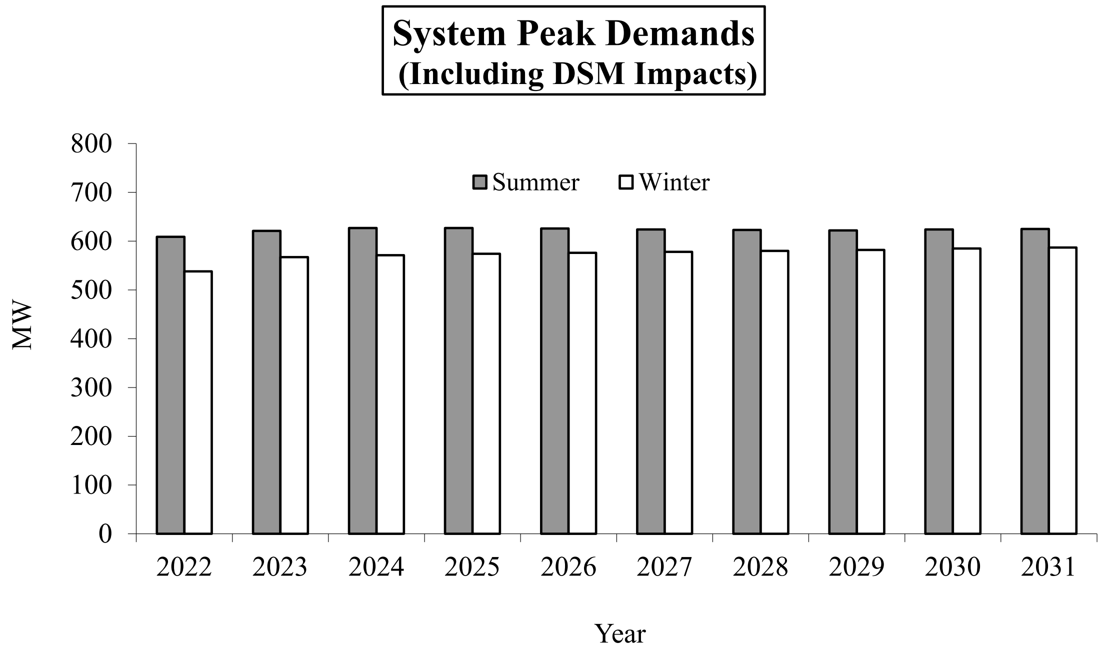
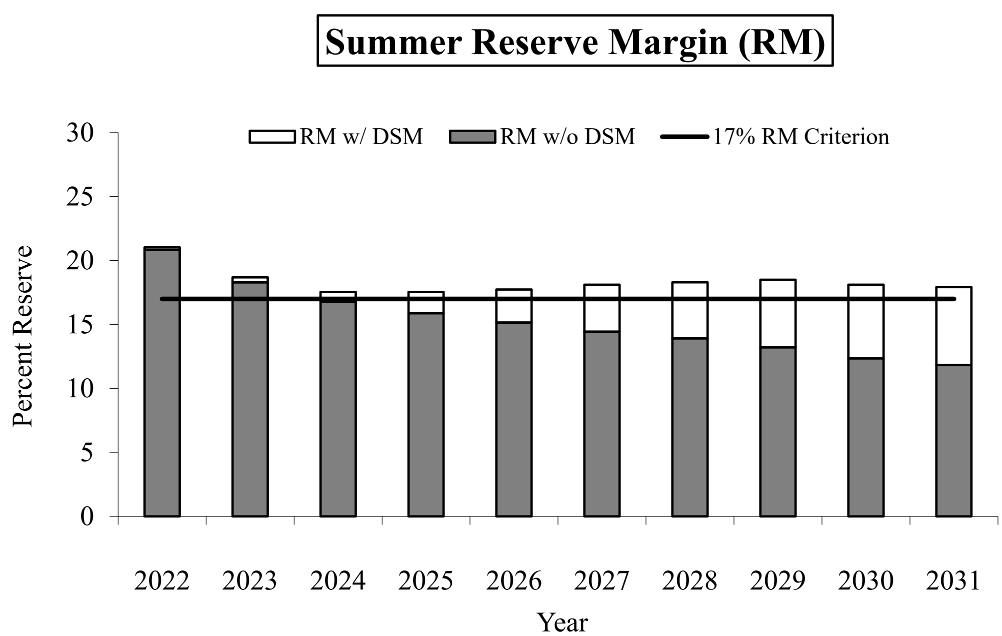
Schedule 8
Planned and Prospective Generating Facility Additions and Changes

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
								Const.	Commercial	Expected	Gen. Max.	Net Capability [1]		
	Unit		Unit	Fuel		Fuel Transportation		Start	In-Service	Retirement	Nameplate	Summer	Winter	
Plant Name	No.	Location	Type	Pri	Alt	Pri	Alt	Mo/Yr	Mo/Yr	Mo/Yr	(kW)	(MW)	(MW)	Status

No Planned and Prospective Generating Facility Additions and Changes


System Peak Demands
(Including DSM Impacts)
Summer
Winter
MW
800
700
600
500
400
300
200
100
0
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Year


Summer Reserve Margin (RM)
RM w/ DSM
RM w/o DSM
17% RM Criterion
Percent Reserve
30
25
20
15
10
5
0
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Year

City Of Tallahassee

Generation Expansion Plan

	Load Forecast & Adjustments								
Year	Forecast Peak Demand (MW)	DSM [1] (MW)	Net Peak Demand (MW)	Existing Capacity Net (MW)	Firm Imports (MW)	Firm Exports (MW)	Resource Additions (Cumulative) (MW)	Total Capacity (MW)	Res %
2022	610	1	609	737	0	0	0	737	21
2023	623	2	621	737	0	0	0	737	19
2024	631	4	627	737	0	0	0	737	18
2025	636	9	627	737	0	0	0	737	18
2026	640	14	626	737	0	0	0	737	18
2027	644	20	624	737	0	0	0	737	18
2028	647	24	623	737	0	0	0	737	18
2029	651	29	622	737	0	0	0	737	18
2030	656	32	624	737	0	0	0	737	18
2031	659	34	625	737	0	0	0	737	18

[1] Demand Side Management includes energy efficiency and demand response/control measures.

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Chapter IV

Proposed Plant Sites and Transmission Lines

4.1 Proposed Plant Site

As discussed in Chapter 3, the City has determined that no power supply resource additions are required to meet system needs in the 2022-2031 planning period. The timing, site, type and size of any additional power supply resource requirements may vary as the nature of future needs become better defined.

4.2 Transmission Line Additions/Upgrades

As discussed in Section 3.2, the City has been working with its neighboring utilities, Duke and Southern, to identify improvements to assure the continued reliability and commercial viability of the transmission systems in and around Tallahassee. At a minimum, the City attempts to plan for and maintain sufficient transmission import capability to allow for emergency power purchases in the event of the most severe single contingency, the loss of the system's largest generating unit. The City's internal transmission studies have reflected a gradual deterioration of the system's transmission import (and export) capability into the future. This reduction in capability is driven by the expected configuration and use, both scheduled and unscheduled, of facilities in the panhandle region as well as in the City's transmission system. The City is committed to continue to work with Duke and Southern as well as existing and prospective regulatory bodies in an effort to pursue improvements to the regional transmission systems that will allow the City to continue to provide reliable and affordable electric service to the citizens of Tallahassee in the future. The City will provide the FPSC with information regarding any such improvements as it becomes available.

On September 24, 2019, the City executed a co-location agreement with Gulf Power Company (Gulf) associated with a potential transmission line to directly connect the Gulf and Florida Power & Light (FPL) service territories. This 176-mile line, referred to as the "North Florida Resiliency Connection" (NFRC), is expected to run from Gulf's Sinai Cemetery Substation in Jackson County to FPL's Raven Substation in Columbia County and pass through the City of Tallahassee's service territory. The NFRC will be co-located within the City's existing transmission corridors for fourteen (14) miles. The City, Gulf, FPL and neighboring electric systems Duke and Southern are currently studying the impacts the NFRC will have on their respective operations, including impacts on the ability to import and/or export power and access to the Southern/Florida interface, and developing prospective mitigation strategies.

Beyond assessing import and export capability, the City also conducts annual studies of its transmission system to identify further improvements and expansions to provide increased reliability and respond more effectively to certain critical contingencies both on the system and in the surrounding grid in the panhandle. These evaluations have indicated that additional infrastructure projects may be needed to address improvements in capability to deliver power from the Purdom Plant to the load center under certain contingencies.

The City's current transmission expansion plan includes a 115 kV line reconductoring to ensure continued reliable service through this Ten Year Site Plan reporting period consistent with current and anticipated FERC and NERC requirements. Table 4.2 summarizes this proposed improvement identified in the City's transmission planning study.

The City's budget planning cycle for FY 2023 is currently ongoing, and any revisions to project budgets in the electric utility will not be finalized until the summer of 2022. If any planned improvements do not remain on schedule the City will prepare operating solutions to mitigate adverse system conditions that might occur as a result of the delay in the in-service date of these improvements.

City Of Tallahassee

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1)	Plant Name and Unit Number:	No Proposed Generating Facilities
(2)	Capacity a.) Summer: b.) Winter:	
(3)	Technology Type:	
(4)	Anticipated Construction Timing a.) Field Construction start - date: b.) Commercial in-service date:	
(5)	Fuel a.) Primary fuel: b.) Alternate fuel:	
(6)	Air Pollution Control Strategy:	
(7)	Cooling Status:	
(8)	Total Site Area:	
(9)	Construction Status:	
(10)	Certification Status:	
(11)	Status with Federal Agencies:	
(12)	Projected Unit Performance Data Planned Outage Factor (POF): Forced Outage Factor (FOF): Equivalent Availability Factor (EAF): Resulting Capacity Factor (%): Average Net Operating Heat Rate (ANOHR):	
(13)	Projected Unit Financial Data Book Life (Years) Total Installed Cost (In-Service Year $/kW) Direct Construction Cost ($/kW): AFUDC Amount ($/kW): Escalation ($/kW): Fixed O & M ($kW-Yr): Variable O & M ($/MWH): K Factor:	

City Of Tallahassee

Planned Transmission Projects, 2022-2031

Project Type	Project Name	From Bus Name	From Bus Number	To Bus Name	To Bus Number	Expected In-Service Date	Voltage (kV)	Line Length (miles)
Reconductor	Line 3B	Sub 11	7511	Sub 31	7531	11/2022	115	2
Substations	Sub 22 (Bus 7522)	NA	NA	NA	NA	[1]	115	NA

[1] The need for this project is dependent on the timing of new construction in the service area for the City's existing temporary Substation 16 for which Substation 22 is intended to serve as a replacement. It is not currently anticipated that Substation 22 will be placed into service within the next five years. The City will provide an update on the status of this project in its 2023 Ten Year Site Plan report.

Figure D-1 – Hopkins Plant Site

Figure D-2 – Purdom Plant Site

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